

volumetric intensity modulated arc technique (VMAT). The Planning Target Volume (PTV) was defined as the GTV plus a personalized Internal Margin and a 3 mm Set-up Margin. Based on the study arm, the first cohort of 6 patients received a dose of 12-26 Gy, and the subsequent cohorts of patients received doses up to 30 Gy. The dose limiting toxicity (DLT) was defined as any acute and > Grade 3 late toxicity (CTC-AE v. 4.03). In case of 2/6 or 4/12 DLT in the analyzed cohort, this dose was considered as MTD.

Results: From August 2010 to April 2015 92 patients were enrolled (M/F: 50/42; median age: 67 years (40-93); range: 40-93) and 142 lesions were treated (bone: 47, lung: 39, nodes: 33, and liver: 23) mainly from prostatic (28%), gastrointestinal (25%), breast (21%), and gynecological (8%) tumors. With a median follow-up of 11 months (2-58), overall response rate was 70% (CR: 47%, PR: 23%), with 15% stable disease and only 4% of progressive disease (15 lesions (11%) not evaluable for response at the time of the analysis). No DLT was recorded. Two-year local control at was 77% and 2-year metastases-free survival was 34%. Two-year overall survival was 78%.

Conclusion: SBRS is well tolerated up to a dose of 30 Gy. The dose escalation protocol is ongoing (Table).

Table: Destroy -2: study arms and dose levels

Dose level	Lung	Liver	Bone	Other
1	26 Gy	26 Gy	12 Gy	16 Gy
2	28 Gy	<u>28 Gy</u>	14 Gy	18 Gy
3	<u>30 Gy</u>	30 Gy	16 Gy	20 Gy
4	32 Gy	32 Gy	18 Gy	22 Gy
5	34 Gy		20 Gy	<u>24 Gy</u>
6			22 Gy	
7			<u>24 Gy</u>	

The dose level in progress is underlined

PO-0775

Risk stratification of vertebral compression fracture after palliative RT for spinal metastases

T. Yu¹, J.H. Kim¹, K. Kim¹, K. Hak Jae¹, E.K. Chie¹, K.H. Shin¹, H.G. Wu¹, I.H. Kim¹

¹Seoul National University College of Medicine, Radiation Oncology, Seoul, Korea Republic of

Purpose or Objective: Vertebral compression fracture (VCF) by involvement of metastatic tumor significantly compromises in quality of life of patients. Spinal Instability Neoplastic Score (SINS) is the classification system to predict VCF, but lacks clinical validation. The purpose of this study was to develop a novel simple method predicting the risk of VCF and compare its effectiveness with SINS.

Material and Methods: A total of 225 vertebral segments in 154 patients treated with palliative radiotherapy from Sep 2011 to Aug 2013 were included for analysis. VCF was defined as occurrence or progression of collapse deformity within treated vertebral segments. Each segment was scored by SINS. In addition to 6 SINS components, we also evaluated the impact of paraspinal tumor extension, epidural extension, tumor origin, performance status, and radiotherapy-related factors on VCF risk. Recursive partitioning analyses (RPA) was used to identify optimal classification of risk groups.

Results: The median follow-up was 8.5 months. The 6-month and 12-month VCF-free probability was 83.3% and 77.3%, and median survival was 10 months. Multivariate analysis identified paraspinal tumor extension ($P=0.03$) and baseline vertebral body collapse ($P<0.001$) were independent

predictors for VCF. All SINS criteria except body collapse were not significant for VCF. The RPA defined 3 risk groups. The lowest risk group ($n=96$) were vertebrae with less than 50% body involved by tumor and no collapse. The intermediate risk group ($n=90$) were vertebrae with more than 50% body involved and no collapse, or vertebrae with body collapse and no paraspinal tumor extension. The highest risk group ($n=39$) were vertebrae with body collapse and paraspinal extension. The 6-month VCF-free probability for each groups were 93.5%, 84.9%, and 53.7%, respectively ($P<0.001$). According to the SINS classification, the 6-month VCF-free probabilities were 91.9% (stable group, $n=78$), 81.9% (potentially unstable group, $n=122$), and 62.8% (unstable group, $n=25$) ($P<0.001$).

Conclusion: Not all the components of SINS were significant predictors of VCF. It is feasible to estimate VCF by the simpler RPA stratification.

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Radiotherapy for painful bone metastases: clinical predictors of efficacy

N. Bychkova¹, E. Khmelevsky¹, A. Kaprin¹

¹Gertzen Moscow Research Oncological Institute, Radiotherapy Department, Moscow, Russian Federation

Purpose or Objective: The purpose of this randomized clinical trial was to estimate prognostic factors predicting symptom control after radiotherapy in patients with painful bone metastases.

Material and Methods: 640 cases of symptomatic bone metastases treated with EBRT were analyzed. The primary tumor sites were breast (419), prostate (52), lung (50), renal (37), colon (13), melanoma (8), sarcomas (7) and others including bladder, thyroid, uterus, carcinoid (54). The lesions of spine and pelvis predominated (48% and 30% correspondingly). Pathological fractures in treatment area were observed in 72,3% for spinal metastases and in 22,2% for long bones lesions. The average pain intensity was 2,2 by the four-point verbal scale and proved significantly lower for carcinoid tumors. Treatment schedules included 2, 3 and 4 fractions of 6,5 Gy and standard treatment schedule with 23 fractions of 2 Gy.

Results: The average follow-up period was 70 months. Overall effectiveness of EBRT - 96,1%. Complete response rate (CRR) - 59,1%. The pain relapse rate - 8,7%. CRR for standard treatment schedule was 77,4% and significantly decreased from 64,4% to 47,9% and 43,6% for 4, 3 and 2 fractions of 6,5 Gy correspondingly ($p<0,05$). There was no correlation between treatment schedules and pain relapse rate. CRR in patients with low initial pain intensity was 87,3%, with moderate pain - 59,8% and intense pain - 42% ($p<0,01$). CRR for spine and pelvis lesions was 63,4% and 59,3%, for long bones metastases - 48,3% and significantly decreased for sacrum isolated metastases - 27,8% ($p<0,01$). The frequency of pathological fractures in treatment area detected no correlation with CRR. High radiosensitivity was revealed for bone metastases of carcinoid with CRR 100%, melanoma - 75%, breast cancer - 64%, prostate cancer - 59,6% and sarcomas - 57,1%. Bone metastases of lung, colon, and renal cancer turned to be radioresistance (44%, 30,1% and 27% correspondingly). Analysis of variance (ANOVA) revealed several factors affecting CRR: tumor primary site ($p<0,001$), total dose ($p<0,001$), initial pain intensity ($p<0,001$), localization of metastases in skeleton ($p<0,02$). In the multifactorial analysis MANOVA tumor primary site and pain intensity before radiotherapy were the only independent prognostic factors of CRR.

Conclusion: Tumor primary site, initial pain intensity, total dose, localization of metastases in skeleton are clinical predictors of radiosensitivity of bone metastases, they significantly affect the CRR.